

# Wafer Size Conversion to 300mm

## Executive Forum

### Trends in Semiconductor Technology

### PICMET'99

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# Technology Pipeline

## Managing innovation and risk

ResearchDevelopmentManufacturing

G3



G2



G1

<b>Snapshot</b>	0.09	300 <sub>mm</sub>	0.13	0.18	.25	.35
<b>\$/year:</b>	~ 10 <sup>7</sup>		~ 10 <sup>8</sup>		~ 10 <sup>9</sup>	
<b>Risk taken:</b>	High		Moderate		Low	
<b>Tech focus:</b>	Evaluate		Integrate		Control	
<b>Mgmt. focus:</b>	Plan		Synchronize		Replicate	(CE!)

# 300mm Conversion

- Cost is the driver - 2.4x die ramp
- Tool Set - Larger foot print, Increasing die based tools
- Silicon - Cost will drive change in usage
- Facilities - Reduced cleanliness
- Automation - Mechanization & Integrated controls
- Operations - Towards “Factory in a Box”
- The Challenge - 200mm factory conversions

# 300mm Automation

- Ergonomics drives 100% mechanization
  - Tall stockers, inter-bay monorail, OHV in all bays
  - Cost: 300mm Intra-bay = 50% of 200mm Intra-bay
- 100% mechanization drives integrated workflow and material flow controls
- Lack of 200mm re-use restrictions allows extensive modernization
  - Manufacturing Executions Systems, Decision Support Systems and Computing Platforms
  - Emphasis is on standards

# 300mm Operations Environment Towards Factory in a Box



- Workforce re-design
  - Significant reduction of direct labor per wafer start
  - Skill Set emphasis on equipment maintenance
  - Location shifts from Bays to Chase
- Communication and Control
  - Command Centers
  - Un-tethered access
- Increased Emphasis on Systems & Integration with Automation
  - Planning, scheduling, Inventory Management, Excursion Management, manufacturing execution...

# The Challenge

## Conversion of 200mm factories

- Two options
  - Conversion in place
  - Shut down and convert
- Both have ugly implications

Next foil is only for reference to aide  
with a question on automation  
equipment suppliers

# Automation Supplier Environment

- Computing Industry Suppliers have aggressive roadmaps. Marketplace establishes standards.
- Semiconductor specific suppliers look to semiconductor companies for content of their roadmaps. Standards are hard to come by.
- Equipment suppliers are acquiring Automation Suppliers